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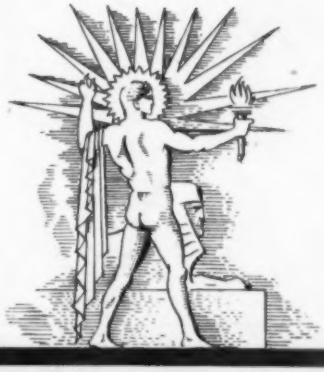
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



July 9, 1938

Testing

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A SCIENCE SERVICE PUBLICATION

Do You Know?

A game rather like modern chess was played in India about 700 A. D.

A glass cornerstone has been laid for the Egyptian Pavilion at the New York World's Fair.

Beavers will eat almost any plant they can find, but they prefer a limited diet of a few favorite trees.

Sirius the Dog Star is sometimes called the Syrian Star because Greek observers sighted it rising over Syria.

The biggest hog on official record is a Poland-China boar that weighed 1,402 pounds when exhibited in 1928.

A subglacial volcano in Iceland gives off great quantities of fluorine, a corrosive vapor that can even dissolve glass.

In Argentina, five large factories are kept busy turning out neon signs, which are increasingly popular in that country.

What to pack in the baby's suitcase—as food supplies and clothing—is told in the U. S. Children's Bureau bulletin "Infant Care."

House flies are known to carry some diseases and are suspected of transmitting tuberculosis by contaminating their feet in sputum.

A snare made of rope and a net, apparently hung across a game trail by prehistoric Indians, was found in an abandoned cliff dwelling in Colorado.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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PUBLIC HEALTH

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What trivial personal habit may lead to a cancer? p. 21.

RADIO

How did American radio amateurs fare at the international conference? p. 25.

The starchy chestnut is the only popular nut that is not rich in fat.

Alexandria was Egypt's capital for about 1,000 years.

Among the animals that furnish meat to Navajo Indians are porcupine, prairie dog, and antelope.

There are hot mineral springs near the Polar Circle, about 194 degrees Fahrenheit.

Over a hundred species of birds have been observed in the Boulder Dam Recreational Area, Nevada.

American traffic ideas, such as street-crossing underpasses and parking decks for storing automobiles, are proposed for London.

The emanation from the feet of a running fox has been known to form a scent band 20 yards broad for hounds to follow, even on a still day.

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CHEMISTRY—CONSERVATION—SOCIOLOGY

Chemistry Able To Destroy Our European Civilization

But If the People Wish, Science Can Create Abundance And Free Man Mentally; Current From Coal Predicted

"CHEMISTRY can and perhaps will destroy our European civilization", Dr. Harold C. Urey, Nobel Prize chemist of Columbia University, warned the American Association for the Advancement of Science meeting at Ottawa.

In the war machines of today, he observed, the important agents are chemicals, explosives, incendiary mixtures or poison gases.

If the people desire, he said, a very different future of chemistry can be painted. Science can produce an abundance of valuable goods, contribute to man's knowledge of the universe, free him from superstition and error and bring him intellectual freedom.

Profound modification of our social and economic institutions is seen by Dr. Urey from the greatly increased productive capacity for material things that chemistry and other sciences make possible.

"There is little doubt but that much of the unrest of the civilized world for the past 25 years resulting in revolutions, new systems of government and world-wide depressions, are all rather closely related to this productive capacity largely brought about by science," he said.

The 1929 economic catastrophe brought about a drop in chemical production that did not fit into the normal way that a new great industry would be expected to grow. Dr. Urey charged that "the masters of industry" may not have realized the natural course of their production but instead stubbornly tried to make production follow a curve of scarcity.

"Cowardly"

The idea that the cure of present bad economic conditions lies in decreasing artificially our ability to produce was termed "cowardly" by Dr. Urey.

Since the World War, no country has arranged its internal affairs in such a way that anything approaching the maximum production of material goods for peaceful purposes has been accomplished, he continued. The United States and Canada have succeeded better than any other country "due undoubtedly to a correct political philosophy, adequate resources, adequately trained men and freedom from threats of invasion." But there was some fatal defect that caused increasing unemployment and inability since 1929 to get production machinery going again.

If adequate chemical production for peace and not for war can be achieved, Dr. Urey foresees for the future:

Better clothes from better textiles, more beautifully dyed, produced with less effort. More wholesome food in greater variety and abundance, sufficient to support larger populations. Houses of materials as yet unknown, more durable, more beautiful and more easily constructed. Liquid fuels for autos and airplanes made from materials grown on farms. New medicines for disease.

Electricity From Coal

The inventor's dream of making electricity directly from the energy of the combustion of coal, without the present intermediary of steam, may be realized in the present generation, Marvin W. Smith, of the Westinghouse Electric and Manufacturing Company, forecast.

This revolution in power production would be accomplished if it were possible to use the electro-magnetic properties of the rapidly moving ionized products of combustion so that they may function properly with some electrical transforming device. The roundabout performance of burning coal, vaporizing water and whirling steam turbines, converting their mechanical energy into electricity by rotating electrical generators, would be rendered obsolete.

"Until very recently, these inventors' dreams remained very remote and seemed far from any practical realization," Mr. Smith explained. "However, with increasing knowledge of the fundamental properties of matter and a better understanding of the conduction of electricity in gases, recent calculations and experimental work indicate that this dream is not so hopeless as it once seemed, and that perhaps within the life of the present generation we may see static electrical devices extracting power from the kinetic energy of the gases of combustion without the intervention of rotating electrical machinery.

"Another very efficient method of producing electricity directly from fuel is by the use of the so-called 'gas cells', in which fuel, such as natural gas, is oxidized through electrolysis in such a way that the energy in the fuel is converted into electrical energy."

We may be able to live in a clean spring or fall atmosphere all the year around in any part of the earth, Mr. Smith predicted. Air would be cleaned and sterilized electrically, as well as controlled as to temperature and humidity

GROUND SLOTH AND GLYPTODONT

Mounted against a background partly painted, partly modeled in high relief, the skeletons of a ground sloth and a glyptodont, animals that lived during Pliocene times, before the latest great Ice Age, are displayed in a unique new exhibit in the Field Museum of Natural History. Their bones are well exposed for examination by scientists, yet their naturalistic poses and outlining prove interesting to the non-technical public.

as in ordinary present-day air conditioning.

Just as the kerosene lamp industry was rendered obsolete by the incandescent gas mantle, and gas lighting was laid on the shelf by the electric lamp, Mr. Smith foresees that the present incandescent lamp may be superseded by the more efficient gas discharge lamp.

Danger of Breakdown

Danger to modern civilization threatens on two fronts. There may be a quick collapse due to war, or a slow breakdown due to internal decay. The only way out is through a general rise in the standard of living of all the people.

Voicing this Jeremiah-vision, Stuart A. Rice of the U. S. Central Statistical Board addressed the meeting. He said:

"There is a real possibility either of general breakdown in social organization as a result of another world war or of a slow decay of social organization arising from more subtle forces of disintegration within the social structure itself."

The danger of breakdown through military pressure, Mr. Rice declared, is due to a change in the nature of war in modern times. War in the past has often served as a force for social unification and progress, but its character has so changed that destruction of social organization is a major military objective.

Plenty for Everybody

The earth's resources are sufficient, even abundant, for any imaginable human needs, if only they are wisely developed and their products equitably distributed. This was indicated in a survey presented by Frank E. Lathe of the National Council of Canada.

Immense supplies of the commoner metals, especially iron, aluminum, magnesium and a few others are within easy reach, the speaker said. A few important metals, like tin, copper, zinc, and lead, face an "obscure" future, Mr. Lathe admitted, but the present supplies are readily available.

There need never be lack of food, clothing, and shelter, he continued. There are food supplies enough in sight now for all the earth's population, and production can be greatly increased through scientific application of fertilizers. Nor is there any visible limit to the possible resources in fiber for clothing and materials for housing. And sources of energy for heat and power are practically unlimited. The real problems facing the world are those of distribution and cooperation.

AERONAUTICS—GEOGRAPHY—ASTRONOMY

Comfortable Week-End Cruises To North Pole are Foreseen

Sikorsky Predicts Service in 100-Ton Boats; Peary Hit Pole Exactly; Find Ancient Chinese Pictures

COMFORTABLE week-end cruises to the North Pole or one-week cruises around the world in 100-ton flying boats within a few years were predicted before the American Association for the Advancement of Science in Ottawa by Igor I. Sikorsky, noted aeronautical engineer and designer of two widely used types of clipper ship.

These flying boats, which will bring Liverpool within 12 or 15 hours of Quebec or India and Australia within three days of America, will appear like zeppelins with a wing on the upper surface, he declared.

Crews of future clippers that will ply the oceans will have their living quarters aboard the planes, in much the same fashion as the crews of today's ocean steamers.

Greater Efficiency

All these things are made possible by the relative efficiency of the large flying boat design. "It appears that above the sizes of 50 or 100 tons, the flying boat will become the most efficient and also the most practical type of heavier-than-air machine," Mr. Sikorsky asserted.

The Sikorsky S-42, the flying clipper used by Pan-American Airways between New York and Bermuda and on other runs, is in important respects more efficient than its smaller and older brother, the S-40, the first clipper-type ship brought out for Pan-American Airways and still in use on many runs in the Caribbean and to South America.

Uses Less Fuel

The newer, larger plane actually uses less fuel and oil for a thousand-mile trip than its smaller predecessor, even though the former carries a payload more than double that of the latter. The newer ship, while carrying 8,363 pounds of payload, requires only 6,692 pounds of gasoline and oil, as against 7,800 pounds of gas and oil for the older ship, which on this same 1,000-mile journey is carrying only 3,200 pounds of payload.

Expressed in a figure used by the aviation industry to describe economic efficiency of an airplane, the newer airplane gets 4.25 ton-miles per gallon as against 1.35 ton-miles per gallon.

Peary Scored Bull's-Eye

Admiral Robert E. Peary, first man to reach the North Pole, scored a bull's-eye on the Pole, Dr. Heber D. Curtis of the University of Michigan, told the Association.

America's Number One Man of the North came within three-quarters of a mile of the center of rotation of the earth on his famous dash north in 1908, a check on his observations by Dr. Curtis reveals.

Peary's own observations were a little bit in error because of a strange prank that a position very close to the Pole frequently plays upon navigators. An observation he thought he was making at noon he actually made at 6; his "midnight" shot was made at 1 and other shots were likewise taken at a different time than Peary himself believed, he pointed out. The errors did not, however, result in any important errors in Peary's observation that he had reached the roof of the world.

"Demon Star"

The hitherto unrecorded spectrum of Algol C, third of three companion stars known together as the "Demon Star" because of the marked eclipse undergone at regular intervals, has been photographed by Dr. J. A. Pearce of the Dominion Astrophysical Observatory at Victoria, B. C., Dr. W. E. Harper, director of the observatory, announced.

Algol, which fades away every 2 days, 20 hours, 49 minutes, was being studied by Dr. Pearce to clear up certain disagreements between theory and observation. The spectrum was recorded in the course of making 58 spectrographic plates of the system. Reason for the triple-star system's fading behavior is that one of the companions is a dying dark star, causing the whole to fade in appearance when the dark star is nearest the earth. The spectrograph is a means of analyzing the light from the star.

Pictures of Ancient China

Knowledge of ancient China, previously confined almost entirely to what has been learned from literature, has been greatly expanded by tile pictures in the tombs of China in early days, Prof. William Charles White, formerly Bishop of Honan, and now of the University of Toronto, revealed.

Dating back 22 centuries, the tile pictures, well-protected through the ages against vandalism, present a new and fresh picture of the costumes, weapons, and pursuits of the time. A large collection of the tiles, which are from five to six feet long, two feet or less in width and six inches thick, is now housed in the Royal Ontario Museum of Archaeology.

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PUBLIC HEALTH

New Attack on Cancer To Seek Early Treatment

A NEW attack on cancer, aimed at prevention and early treatment, was explained by Dr. Ludvig Hektoen, executive director of the National Advisory Cancer Council.

Where in the past states have tried to open new institutes for the seriously ill cancer patients, now it is being advocated that the main attack be turned on state-wide prevention and early treatment of this disease in its controllable stages.

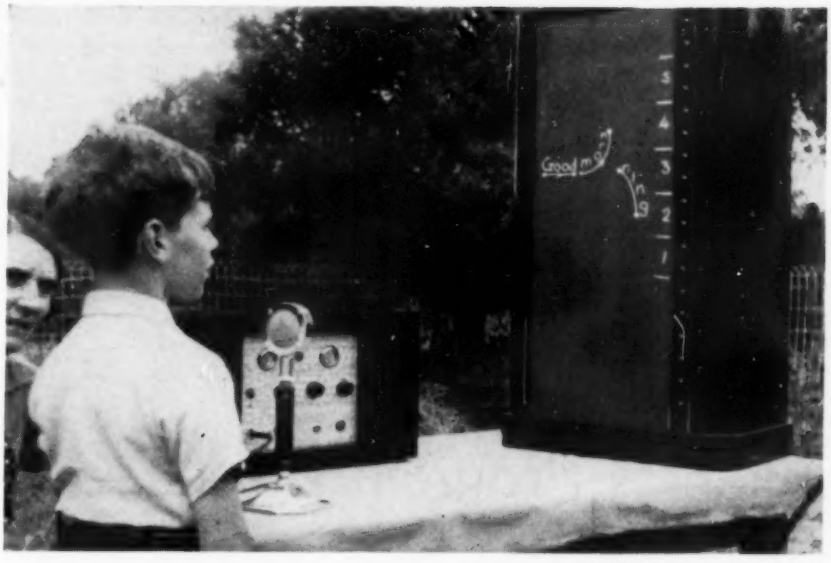
Dr. Hektoen, who addressed the annual conference of health officers and public health nurses of New York State, pointed out that this state-wide, local method of fighting cancer is recommended by the State Cancer Commission which New York's legislature appointed to study the problem.

Dr. Hektoen emphasized that the control of cancer is a public health problem affecting an entire state. Since the majority of people in a state are unable to get early diagnosis and proper treatment if they develop this disease, it is becoming recognized that state health agencies have the duty of helping forestall this serious and dangerous malady.

Prevention of cancer includes teaching the public to avoid occupational hazards and personal habits, such as rubbing the tongue against a rough tooth, which may lead to a persistent and possibly cancerous sore.

Science News Letter, July 9, 1938

The most brightly colored of all large birds is the flamingo.



TALKING IN COLORS

The vertical row of colored lights, which flash to show this deaf child whether his voice is pitched naturally or not, is controlled by tuning forks operated electromagnetically. The youngster talks into a microphone, tries to imitate the rise and fall of voice indicated by his teacher on the blackboard before him.

PSYCHOLOGY

Ways of Helping Deaf Child Discussed at Conference

Mechanical Device Enables Deaf To Avoid Monotone; Efforts At Salvaging Residual Hearing Successful

NEWEST ways of helping deaf children get along in the world were given serious consideration at the meeting in Detroit of the American Association to Promote the Teaching of Speech to the Deaf.

Educators give the cheering news that it is far less tragic for a child to have defective hearing now than a generation or two ago. So much more can be done.

Statistics show 1,600,000 children in the United States, or six out of 100 of school age, have defective hearing. Of these, 300,000 are seriously enough affected to need eyesight help by reading a speaker's lips.

Under discussion was an invention from South Africa, which an engineer has devised to teach deaf children to talk naturally, instead of in a dull monotone. The invention, used successfully in South African schools for the deaf, looks like a box. At one side is a vertical string of fourteen light bulbs, gay colors. On the front of the box is a green blackboard. The teacher writes "Good morning" on the board, and draws a curve to show how the voice should rise and fall. The deaf child says, "Good morning," and the colored lights flash to show the pitch of his voice. Electromagnetically operated tuning forks operate the device. The top four and bottom two lights are red, meaning danger —voice too high and shrill or too low and gruff.

Inventor of the device is A. E. Coyne, instructor in engineering at Cape Technical College. The invention is mainly for the totally deaf child, who has no way of hearing his own speech defects.

Helping the deaf child to "hear" by feeling the vibrating bones of a speaker's head is another recent development discussed and demonstrated. At the Detroit Day School for the Deaf, where this vibration method has gained fame, all incoming classes are taught to feel speech. Children who have little or no hearing, cannot get help from mechani-

cal devices. They can, however, learn to "hear" what a speaker says by casually placing a hand almost anywhere against the speaker's cheek or on his head.

Strenuous efforts of educators to salvage what precious hearing the hard-of-hearing child may have was another topic of the conference. It is now realized that many a child who seems totally deaf, actually has a good deal of hearing which, if not neglected, can be trained and improved.

Educators tell of one child who was in a school three months before any one realized she could hear anything. She was considered a deaf mute. She knew written language and read lip motions of speakers. But speech was as foreign to her as Turkish might sound to the average American. Then, in less than four months this supposedly deaf child was taught to hear and understand 300 words.

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BIOLOGY—PHYSIOLOGY

Eugenics Program Declared Impracticable at Present

Dr. Lillie Urges Institutes for Further Study Of Human Genetics; Vitamin E Cures Sterility

EUGENICS is not a practicable program at present, both because we do not yet know enough about human heredity and because human social organizations are not adapted for the carrying out of such a program.

So declared Dr. Frank R. Lillie, president of the National Academy of Sciences, before the Ottawa meeting of the American Association for the Advancement of Science.

"Biological opinion is divided," Dr. Lillie said, "because our knowledge of human heredity is quite rudimentary as compared, for instance, with our knowledge of heredity in fruit flies or guinea pigs. Even if we felt sure that our knowledge of the principles of heredity in lower animals is theoretically fully applicable to mankind, we would not know how to apply it eugenically except in most general terms, for there are no pure lines in human inheritance for one thing, and for another, we have no animal analogies to the human qualities of character that we most need in the social process.

"Biological opinion is divided even on the subject of negative eugenics, the elimination of the unfit, not so much on the general desirability of the principle as on the definition of unfitness, the determination of standards and the methods to be employed," Dr. Lillie continued. "Sociological and political opinion is also divided sharply, on the question of the trends of existing social, economic and political selective processes as they affect population, and the desirability of applying such a sharp instrument as radical eugenics to society before the possibilities of social amelioration in other ways are more fully explored. Under these conditions we should have institutes specially devoted to human genetics for the sake of the medical as well as of the social problems involved.

"One sometimes feels tempted to despair of the social coordination of scientific knowledge for the increase of the well being and happiness of mankind. But faith in the progressive evolution of mankind is stronger, in the scientific world at least.

"I have the conviction that the ethical principles of Christianity are widespread among the masses of mankind, and that they will prevail. But the processes of evolution are slow, and we may have to wait a long time."

New Hormone Substance

A new hormone substance of the pituitary gland, often called "the gland in the driver's seat," was presented to the scientific world by Drs. A. H. Neufeld and J. B. Collip of McGill University's Department of Biochemistry, Montreal.

It has "ketogenic and anti-insulin properties" which means that it forms ketone in the body and that it opposes the action of insulin so useful in treating diabetes. Dr. Collip was one of the Canadian team of research workers who developed insulin.

The new substance or substances have their origin in the "pars intermedia" or the portion of the gland between the anterior and posterior parts, Drs. Neufeld and Collip suggest. Thus there are added to the previously known products of this tiny gland of the head a new material from its middle portions with new and perhaps important functions in the body's health and illness.

The Montreal scientists would not speculate on the physiological significance of their findings although they said they were tempted to do so. They feel that it is judicious to await further developments before doing this.

The known effects of anterior lobe extracts upon growth, the thyroid glands, the male sex glands and the adrenals were differentiated from the newly discovered fraction.

Cures Sterility

Vitamin E seems to be a factor in allowing some women to bear children who otherwise can not become mothers, data presented by Dr. E. M. Watson of the University of Western Ontario Medical School indicated.

Reviewing research on the anti-sterility vitamin, he told how clinical use of wheat germ oil prevented in many cases habitual abortion in women. Experiments suggest also that it activates the anterior lobe of the important pituitary gland. He warned that one portion of ether-extracted wheat germ oil may produce cancer.

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MEDICINE

Seek to Prevent Deaths From Epidemic Diarrhea

MEASURES to prevent death of new-born infants in hospitals, from epidemic diarrhea and other infections, were described by Dr. Samuel Frant of New York City's Department of Health, speaking at the annual conference of health officers and public health nurses of the state. Dr. Frant said that epidemic diarrhea of the new-born is a highly communicable infectious disease, the cause of which is still unknown.

In 27 outbreaks of this epidemic disease in three and one-half years, he found that out of 5,082 infants exposed to the disease, 750 took it and 356 died.

Dr. Frant said that New York City has adopted a series of measures to save its babies from this hazard:

1. Hospitals are required to report any case of diarrhea in an infant less

than three weeks old. This helps in detecting the epidemic form of the disease early.

2. All infant deaths are investigated, to check accuracy of the diagnosis on the death certificate.

3. The city's sanitary code has been amended to require maternity hospitals to take added precautions, safeguarding babies from infection.

Other safeguards include requirements as to preparation of babies' formulas, laundering of their linen, regulation of visiting hours and limiting one nurse to the care of not more than eight babies in the hospital nursery.

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MEDICINE

Vitamin B_1 Injections Bring Relief From Acute Neuritis

Excruciating Pain Accompanying Leprosy Given Quick Relief; Administration By Mouth Unsuccessful

RELIEF from the excruciating pain of neuritis, which accompanies some cases of leprosy, has been achieved through studies made by scientists of the U. S. Public Health Service at its Honolulu station.

Injections into the muscles of solutions of vitamin B_1 produce amazing relief from the crippling pain, indicate Drs. L. F. Badger and D. W. Patrick of the Leprosy Investigations Division (*Public Health Reports*). Even in the cautious medical language of the announcement the results are called "spectacular."

Lepers with acute neuritis were sometimes in such pain that it was almost impossible for the physicians to make an adequate examination of the swollen nerves because the patients could not permit their bodies to be touched. Such victims were given relief within 24 hours in some cases. And in all but one patient, relief came within three or four days.

Test Groups

In the tests at the leper colony in Hawaii the physicians used 59 patients split into four groups. One group received vitamin B_1 by drinking pineapple juice containing brewer's yeast, which has a relatively high content of the vitamin.

Another group took their vitamin B_1 in concentrated form by mouth. A third received the concentrate by intra-muscular injection. The fourth group served as a control and did not receive special doses of the vitamin.

While the number of patients receiving the injections were small (only 10) the results were amazing. The scientists plan to continue their study on a much larger group of cases. Discussing their results they say:

"The results obtained in the few cases of acute leprous neuritis reported here strongly suggest that material benefit is derived from intramuscular injections of vitamin B_1. Our experience also suggests that similar results are not obtained by oral administration of that vitamin. No improvement was noted following administration, for over a 6-month period, either of large doses of brewer's yeast or of vitamin B_1 concentrate. On the contrary, acute neuritis developed after the vitamin B_1 concentrate was given (by mouth), in one case for 6 months and another for 8 months."

Quick Relief

Comparison of the new injection treatment with other methods used in the past, shows a marked decrease in the time needed for relief, the physicians point out.

One patient in the test had previously had an attack of acute neuritis which persisted for 24 days when treated by former methods. In a new and severe attack, the injections stopped pain after three days and tenderness after four days.

The government physicians, while reporting on the spactacular results, stress the importance of future work. Only in a large group of cases, well controlled, they state, can the true value of this treatment be definitely determined.

Serious lack of vitamin B_1 in the human diet has been found to be the cause of dread beri-beri disease, so prevalent in the Far East. But even in America an insufficiency of vitamin B_1 in the diet is believed responsible for many cases of neuritis with its painful symptoms. Injections of vitamin B_1 sometimes bring relief for this lesser disorder, also.

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Iron ore production in the United States increased 48 per cent in 1937 over 1936; copper increased 38 per cent; tungsten 34; aluminum 30.

FORCE-FEEDING

Cannoneers serving an old-fashioned muzzle-loader used about the same technique that is necessary in feeding the Maharanee of Whangkoo, 22½-foot python in the St. Louis Zoological Park. A stiffish piece of two-inch rubber hose, five feet long, is "loaded" with ground rabbit meat, and one end is pushed into the Maharanee's throat. Then a keeper rams the charge home, while about ten other attendants sit on the big snake to hold her still. Twenty-one pounds constitutes a full meal—but she gets it only once a month.

INVENTION

Invents Torpedo that Turns And Goes Back to Target

A TORPEDO that does the seemingly impossible in turning around and going back after the target it has just missed has been patented by Ellison S. Purington of Gloucester, Mass.

A trailing wire contains the secret of the performance of this newly-designed underwater weapon, the specifications for the patent, No. 2,121,446, reveal.

If the torpedo misses the target and crosses ahead of the ship it is aimed at, a wire trailing behind the torpedo is touched by the ship's bow, closing a contact and causing the torpedo to turn around and go back for a second try with its deadly cargo. The direction in which the torpedo will turn is determined by the direction of the ship it is aimed at, a manual setting of the torpedo being made just before it is fired. Little difficulty is anticipated on this last score because of the fact that a torpedo is fired from relatively short range.

The invention is assigned to John Hays Hammond, Jr., also of Gloucester. Mr. Hammond is noted as a torpedo inventor and designer of widely-used radio equipment.

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PUBLIC HEALTH

Preventable Smallpox Still Fells Thousands Each Year

IF THERE is any disease that it is almost criminal to have, that disease is smallpox. Ever since the time of Jenner, the simple process of vaccination prevents it at trivial cost and inconvenience.

America's largest city, New York, has been entirely free of smallpox since 1932 and no one has died of that disease there since 1926. That can hardly be said about any other human ill.

But the United States is not free from smallpox. In fact, this disease is on the increase. There were 11,806 cases in 1937 as compared with 7,844 the year before, according to Metropolitan Life Insurance Company figures.

This is disheartening to medical authorities. A few years ago it seemed that the disease was at last coming under control and would be eliminated as a major health problem.

Fortunately, the form of smallpox prevailing in the United States is mostly the mild, non-virulent type which causes relatively few deaths. But this mildness may change to a more deadly form, killing hundreds or thousands before vaccination stops the march of a serious epidemic.

It is not the congested areas of the East that constitute smallpox's stronghold. The record of the past five years shows only 256 cases in eight crowded Eastern states, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland. There were 14,203 cases in eight less populous states in the opposite corner of the U. S. A.—Washington, Oregan, Idaho, Montana, Wyoming, North and South Dakota and Nebraska. The contrast was one case per million of population as against 428 cases per million.

This difference is merely a matter of how widely vaccination is practiced.

For smallpox flourishes in every clime and country if given the chance. Evidently only a devastating epidemic of the more dangerous kind of smallpox will teach a costly lesson where vaccination is lax.

Science News Letter, July 9, 1938

ICHTHYOLOGY

Fish Out of Water Seem To Die of Exhaustion

DEATH of fish out of water seems to be due to their violent struggles rather than to inability to get oxygen through their gills, concludes Prof. A. G. Huntsman of the University of Toronto (*Science*, June 24).

It has always been assumed that fish out of water die because atmospheric oxygen will not pass through their gills into their blood, but Prof. Huntsman states that he cannot find any really solid evidence in support of this assumption.

He does find, however, that tissues of captured fish after death have little or no glycogen, which is the energy-yielding animal sugar; also that their blood contains a high concentration of lactic acid, which is the typical chemical end-product of muscular exertion. This gives a physiological picture of death from over-exertion rather than from suffocation.

Further support for the new theory is found in the fact that nervous fish, like herring and haddock, die much more quickly when taken out of the water than do sluggish fish not given to strong struggles, like eels and catfish.

Science News Letter, July 9, 1938

IN SCIENCE

ARCHAEOLOGY

Camera and Plane Needed To Outline Roman Empire

WHEN ancient Rome was in power, the civilized world knew well enough where the guarded frontiers of Roman empire ran.

Today, it is taking the super-eye of the camera looking down from an airplane to find obliterated lines of that empire.

Work of mapping the whole Roman Empire was started in 1930 by an international commission of geographers. Since then various countries that control regions of the one-time empire have helped with the problem.

Ruins of old forts and roads and embankments have to be studied by the slow, hard process of excavation. But it is the flying archaeologists who have been scouting out the lay of the land for the excavators, and mapping for them the most elusive lines of lost frontiers.

In Syria, a French archaeologist, Père R. P. Poidebard, has done much to trace Roman fortifications from Bostra eastward toward the Tigris. His interest in aerial photography goes back to 1926.

Père Poidebard has learned by experience that in this desert country ruins appear and vanish even so far as the sharp eye of the camera is concerned. Not only the season but time of day and weather conditions affect sighting of phantom ruins.

Early morning and late afternoon light are best for sharpening the shadows and bringing out obscure patterns of ancient handiwork buried lightly in the earth. Yet, the French observer has outwitted the sun on occasion, making hidden ruins visible near midday by the trick of flying low and using the plane wing to shadow the ground. The first time he used this technique, he detected an ancient road leading toward the Tigris River, that previous observers had missed.

Once spotted, the ruins are marked on maps, and then the spade expeditions go out, to learn more about the frontier defenses in which ancient Rome put her trust.

Science News Letter, July 9, 1938

NCE FIELDS

PHYSIOLOGY

Sulfur Found Negligible In Air Pollution Effects

SULFUR vapors in the air, often cited as a major cause of air pollution, have been found to be an almost negligible factor as far as physiological effects are concerned, in a study recently completed in five large metropolitan areas throughout the nation. The results of the investigation, which lasted 15 months, were announced by the Air Hygiene Foundation and Mellon Institute in Pittsburgh.

Over 50,000 separate air tests were made by six chemists, during the study. They covered all hours of the day and all seasons of the year.

The area of Washington, D. C., is by far the cleanest of the five regions in its sulfur dioxide content, the report showed. The five, in the order of their sulphur dioxide pollution within a 15-mile radius of the center of the city are: St. Louis-East St. Louis—average, .128 parts per million, and maximum, 2.266; Pittsburgh—.057 and .897; Detroit—.028 and .396; Philadelphia-Camden—.027 and .424; Washington—.009 and .290.

Science News Letter, July 9, 1938

MEDICINE

The Family Doctor's Success Explained by Freud's Theory

IT SEEMS a far cry from the good old family doctors of grandfather's day to Dr. Sigmund Freud, founder of psychoanalysis. To most laymen the famous Viennese psychiatrist is known chiefly for having indirectly brought sex talk into the parlor. Even those who understand a little of the basis of psychoanalysis probably fail to realize that Dr. Freud made many other contributions to medical science.

One of his great contributions is his concept of transference. This concept explains why the family doctor made you feel better the moment he entered the room. It explains why you are not much relieved and perhaps a little disappointed when, after being put through a whole battery of X-ray, blood-sampling and stomach-pumping tests, the modern ultra-scientific and often expensive diagnostician gives you a "clean bill of health." The Freudian concept of transference even explains why quacks flourish in the land.

All this was recently pointed out by Dr. Winfred Overholser, superintendent of St. Elizabeths Hospital, the government institution in Washington for mentally sick patients, in a lecture at George Washington University School of Medicine.

The concept of transference refers to that transference which occurs between patients and physicians in which, to use Dr. Overholser's words, "the physician, to a large extent, takes the place of the father and becomes a crutch upon which the patient can lean."

The family doctors, without knowing or consciously practicing psychiatry, made good use of this concept. With the vanishing of this attitude between patient and physicians much of the effectiveness of the physician has vanished, Dr. Overholser says.

Because patients miss this crutch in many modern physicians, they accept readily the assurance, the crutch, held out to them by quacks and irregular practitioners.

Science News Letter, July 9, 1938

RADIO

U. S. Radio Amateurs Retain Their Frequencies

AMERICAN amateur radio operators, ever alert to the threat that they will lose their precious frequency bands to commercials or government services, successfully retained their allotted frequencies at the International Telecommunications Conference in Cairo, delegates of the American Radio Relay League reported.

Their European confreres, however, suffered reduction in the size of one of their bands and are forced to share another. The reductions came about because of the pressure of European governments interested in extending military, aeronautical and television frequencies.

The delegates, Kenneth B. Warner and Paul M. Segal, representing the A. R. R. L., the organization to which most American amateurs are affiliated, reported that the American hemisphere conference at Havana held earlier was a major factor in their success. Allocations for North and South America were settled there and they were able to present a united front in their defense.

Science News Letter, July 9, 1938

PSYCHOLOGY

Method of Child Discipline May Make or Mar a Leader

MANY nations are now facing political crossroads; people are being forced to choose between left and right and the less propagandized middle road of democracy.

When the voters of the United States are faced with such a decision, the outcome will depend to a large extent upon the way in which the little children of today are being trained in the home. If a boy is brought up to be dependent upon adult affection and approval, if he has learned to lean on others for guidance and decisions, is it not likely that as a man, he may be willing to sacrifice freedom for security and a life planned for him?

If he has been early freed from the shackles of paternal authority and maternal solicitude, and has learned to stand on his own two feet, to use initiative, to think for himself, will not his choice be very different?

At the Pennsylvania State College, a study conducted by Dr. Robert G. Bernreuter, psychologist, seems to indicate that the most intelligent of our children coming from culturally superior homes—those whose endowment would fit them to be leaders—are not being trained to be self reliant and independent of adults. They are not more socially mature or more able to do for themselves than are the run-of-the-mine children who are their inferiors intellectually.

Methods of discipline in the home have to do with developing this independence, Dr. Bernreuter found. Penance is likely to spoil the personality, parental temper turns the child from reality, inconsistant discipline is the worst possible type.

The best form of discipline consists of permitting the natural consequences of the acts of the child to be the disciplinary agency, Dr. Bernreuter told a conference on education recently held at the Wood Schools.

Parents who permitted the acts of the child to discipline him are repaid by having children with more attractive personalities who are more ready to face reality, and, fortunately, who are more independent of adult affection, he said.

From among such fortunate children, the future leaders of America may be expected to arise.

Science News Letter, July 9, 1938

Ancient Babylon was proud of having a "road glistening with asphalt".

POPULATION

The Unemployment Army Grows

Never Before Have So Many Young People Been in the Labor Market; Never Competition for Jobs So Keen

By MARJORIE VAN DE WATER

AS the academic processions disappear with the passing of June, commencement will be observed in places far removed from the campus. Employment offices will form their own processions of something like 1,075,000 high school graduates many of whom will be looking for jobs this summer and of an added 145,000 college graduates who will join the search.

Never before has the search for employment been shared by so many young people. Never before has the door to industry's personnel offices been battered by so many knocks. Never has such a large army been prepared to do the work of the world—to grow food for the hungry, weave cloth for the naked, and build shelter for the homeless.

For despite the growing numbers of old people in the United States, and despite the dwindling numbers of babies coming into the world here, the number of young people reaching productive age is steadily and rapidly increasing.

It is estimated that among the farm population of the United States, the present generation will see 3,800,000 youths reach the age when they can put hand to the plow in excess of the number matched by those leaving the field for retirement or death.

Starts on Farm

For it is down on the farm that the whole problem of unemployment has its start. There, birth rates are high. There, schooling opportunities are limited. There, are growing up large numbers of young people who are now, or will soon be, hunting for jobs.

Where can they find them? Not more than a half or perhaps only a third of the young people growing up in rural areas will find farm jobs open for them. And even this small number is being cut into by improved agricultural methods.

Half the farms in the nation were not needed in the boom year of 1929 to feed and clothe the non-farm people. This inferior half produced only 11 per cent. of all the products sold or traded.

Man power is not in demand in the great farming areas. Nor is it likely to be in the future, judging from present prospects. Not more than a fifth of the excess can find jobs there.

During the depression years of 1930 to 1935, a back-to-the-land movement brought many jobless men from the city to the farming area looking for work. They did not find it in the corn, cotton, or wheat belts. These great commercial farming areas actually lost farm population during that time.

Before the depression, when a boy became old enough to look for a job, if he had ambition he went to the city. The city, with a relatively smaller number of growing children, had also a relatively smaller number of maturing youths, and could hold out opportunities to a great many of the farm surplus. So to the city they went. And young people of the large families of the South went to the North.

Thirty Per Cent. Leave

This trek is illustrated by figures showing what happened to natives of the State of Kentucky. In 1930, nearly a third, 30 per cent., of the 3,300,000 born in Kentucky were living outside their native state. Two-thirds of those had gone north and were living in northern and northeastern states.

The trek was greatest from the poorest lands. But the Great Depression changed all this. No job in the city means no food and no home, so with the crash in 1929 there began a general song of "Carry me back" to Virginia or Kentucky or some other farm area, usually the place which the boys in better times deserted to seek their fortunes.

Thus the back-to-the-farm movement meant, in general, a back to the poor farm movement. The new migrants from the city did not go to prosperous lands but to farms that had been previously deserted and that were incapable of supporting the population they already had.

Meanwhile, there occurred no lessening of the numbers of young people growing up on the farms. Not counting migration to or from the city, the depression years from 1930 to 1935 saw an increase of just one million in the rural farm group of working age.

Two million rural young people were forced to accept public relief during these years instead of becoming self-supporting as they should under proper social conditions.

With the return of better times, there began another migration to the cities, but the latest Census Bureau figures show that again the tide has turned.

But the city already has its own excess of young job seekers. Although the rate is dropping with lowering birthrates, it will be ten or more years before the number of young people reaching the job-hunting age is down to match the number of oldsters that might be expected to vacate jobs through death or retirement.

Peak Reached

According to Dr. T. J. Woofter, Jr., coordinator of rural research of the Works Progress Administration, who is authority for these estimates, the early 1930's saw the greatest expansion of the number of job-seekers that the United States is ever likely to experience.

In the years from 1930 to 1936, just at the time when the nation was hit by severe hard times and reduction in employment, the peak of increase in the population of working age occurred.

More than three million young men and more than three million young women were added to the job-seeking lines during that time in excess of those who left the working group by the roads of old age or demise.

"This increase of employables occurred at a time when industry was least able to absorb them," Dr. Woofter said. "This is one of the chief reasons why the numbers applying for public relief continued to increase through the early months of 1935 although industrial employment steadily improved from 1932 through 1936."

It may seem strange that such an excess of job seekers should occur after a decade of declining birthrates, but that becomes understandable when we consider that the decrease in number of births would not make itself felt in the employment ranks until 18 or 20 years later.

In about twenty years in the future, we may have a stabilized population of those of working age when the new recruits will just about equal those drop-

ping out of the picture. But that doesn't help with present problems.

In 1930, New York, New Hampshire and Rhode Island were the only ones to have a stationary working population, although New England and the Pacific Coast states have less than one per cent. of increase. The greater part of the country has an annual increase of from one per cent. to 3 per cent. in the number at working ages.

Employment pressure is greatest in Utah, North and South Carolina, Georgia, Alabama, Oklahoma and Texas. The rate there is over 3 per cent. For every thousand male workers on North Carolina's farms, 36 new recruits are ready annually to step into the employment line, besides those needed to replace men who are stepping aside.

In the drought states, if there were no migration, the pressure for jobs would be tremendous. As the children now under 18 years mature, over a quarter of a million youths will reach working age in excess of those needed to replace the older men withdrawing from the group in productive ages.

Along about 1955 we may expect this particular problem to be reduced, but in the meantime something must be done for these thousands of young people.

Lack Training

One of the greatest difficulties of the problem is the lack of training of so many of these young people. Large families, high birth rates, and the later maturing of large numbers of young people are most frequent where incomes are at the lowest ebb. High school facilities are completely lacking in large rural sections of the United States. Grade schools are likely to have short terms, poorly trained teachers, and limited facilities.

Of the rural youth who were on relief and were out of school, almost one-third had completed less than seven grades of school. Only one-fourth had gone beyond the eighth grade. They were fitted only for work on the farm or for unskilled labor.

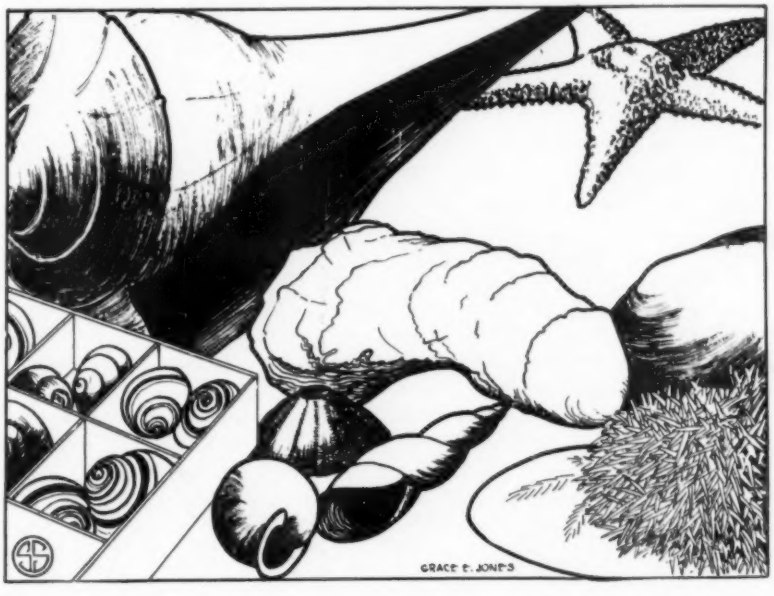
A permanent CCC, which would enroll all young men when they left school and which would offer training fitting them for some sort of skilled work and which would also give training in citizenship, has been proposed as a means of removing large numbers of young people from competition for jobs.

Such government programs as that of student aid through the National Youth Administration are also designed to keep young people in school longer and so leave the jobs open (*Turn to page 30*)

Inexpensive Summer Fun

You Need Only Eyes and Hands To Collect Shells

(Fourth of a series of 12 articles. Next week—Collecting Mosses)



Eyes and fingers are only essentials for collecting shells. Smaller shells may be kept in boxes like that at lower left; cardboard strips make very good partitions. Besides the two great classes of shells as represented by snails and oysters or mussels, collectors at the seashore will also find interesting-looking starfish and sea-urchins.

SHELLS, together with other beach trophies like starfish and sea-urchins, are among the most interesting objects a young collector can gather during a summer's holiday weeks, yet they are also among the easiest things to collect and take care of. Nothing is needed to capture them but eyes and fingers, and the simplest kind of boxes will do for their housing.

To be sure, dealers offer attractive trays, and these are very good if you really go in for a full-scale shell cabinet. But at the outset, ordinary small cardboard boxes will do for small shells, and cigar boxes or even larger containers for the heavier varieties, like conch and turret shells from the seaside, or river mussels from inland streams. For the very tiniest, most delicate shells, it is

For more information

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Please send me **Bulletin 4,** containing additional information about collecting shells and your list of books and leaflets on the subject.

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advisable to nest them in small pillboxes containing a bit of absorbent cotton.

Containers of some kind, however, are really necessary, because even apparently stout shells are not as stone-strong as they may look, and tumbling them about in a loose mass will soon cause a good deal of breakage. For large numbers of smaller kinds, you can make compartmented trays by dividing up shallow cardboard boxes with cardboard dividing strips.

Most shells are the empty houses of animals of the great group of lower animals known as mollusks. This group is divided into several sub-groups or classes. Practically all land and freshwater shells, as well as a very large proportion of sea shells, belong to two of these classes. One is the group usually called bivalves, typified by clams, mussels and oysters; the other comprises the snails and their relatives. Your first collection, whether made inland or at the seashore, will very likely consist almost entirely of shells of these two classes.

You do not need to wait until you learn the names of all your shells before you arrange and classify them. Just put the ones of the same shape together. Shape is more important than either color or size, in classifying shells—or indeed in classifying most objects in natural history.

While the seashore is traditionally the prime collecting place for shells, it by no means has a monopoly in them. Snails go everywhere, in fields, in ponds and streams, up trees and bushes, even in the desert; and freshwater mussels are found all over the country wherever there are rivers or creeks. Some of the most beautiful of all shells are those of the tree snails.

You can also collect buried shells, if you can find a place where the bank of a stream or lake is being washed away, or where an artificial excavation is being made. These shells will usually have lost their colors, but their interesting shapes will remain. Some of them will be near the surface, and quite recent; others, more deeply buried, will represent little lives that were lived there centuries or even thousands of years ago.

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In British experiments, children given two-thirds of a pint of milk each day at school gained in weight and muscular strength more rapidly than children who did not get extra milk.

MEDICINE

New Epilepsy Remedy Works With Two-Thirds of 100 Patients

Diphenyl Hydantoin Prevents Seizures Entirely in Some Individuals; No Harmful Effects Noticed

FIRST reports of success in treating epilepsy with a new, scientifically selected remedy were presented by Drs. H. Houston Merritt and Tracy J. Putnam of the Boston City Hospital and Harvard Medical School at the scientific exhibit of the American Medical Association.

The new remedy is diphenyl hydantoin. It has been given to more than 100 epileptics who had previously been treated for a long time by such standard methods as phenobarbital, bromides, and high fat diet without obtaining any relief. Over half the patients suffering from grand mal epilepsy and about one-third of those suffering from petit mal have been entirely relieved. The frequency of attacks has been greatly reduced in another third of the patients in each group.

One of the patients, a 15-year-old boy, had had daily attacks of grand mal which were not affected by phenobarbital. From Sept. 15, when he started taking diphenyl hydantoin, until the following May 1, when he forgot to take it while away on a house party, he did not have a single attack.

The new remedy has been given to patients daily for periods from nine months to three months. No deaths have occurred and careful tests of kidneys, blood and liver have not shown any harmful effects. A few patients have had skin rashes which cleared up and a few had spells of dizziness and slight drowsiness but these also disappeared.

A few patients were not helped by the new remedy.

This remedy is the first ever tried in epilepsy after a careful scientific selection. Phenobarbital and other remedies which have helped some patients but not all were first tried experimentally on human patients.

The usefulness of diphenyl hydantoin was determined in the course of systematic trial of over 100 drugs. The trials were made on cats which were having fits or convulsions like those of epilepsy. One by one, these other drugs were discarded because they failed to prevent fits with certainty. (See *SNL*, May 14).

Diphenyl hydantoin stood up under these tests and was then given to patients. An important feature of this remedy, Dr. Putnam pointed out, is that it does not induce sleep, as phenobarbital does. This shows that the convulsions of epilepsy can be controlled without putting the patient to sleep or drowsy.

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ARCHAEOLOGY

Find Signs That Norsemen Were in Canada, 1000 A.D.

A VIKING sword and armor, unearthed in northern Ontario, may prove once and for all that Norsemen took themselves far inland on American soil, 500 years before Columbus.

The important relics, unearthed at a mining claim near Beardmore, Ontario, have been deposited at the Royal Ontario Museum.

Director of antiquities, Dr. C. T. Currelly, has submitted pictures of the war gear to authorities on Norse archaeology in Europe, and is assured by all that the relics are the sort of fighting equipment used from 950 to 1000 A.D.

Prof. D. McArthur, deputy minister of education, is to submit a report on the historic objects to the legislature.

The discoveries consist of a sword, battle axe, shield handle, and pieces of rusty armor. The first discovery was made in 1931 by the owner of the mining claim, James Dodds, but its importance was not impressed on him until two years later by a university professor.

The Geographical Journal, British scientific publication, comments that the Norse armor find, if accepted as authentic history, tends to support the view that Vinland was not in Massachusetts, but farther north, and that Norsemen who explored the interior of America would have journeyed from Greenland south to Hudson Strait and across Hudson Bay and then toward the Great Lakes.

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ENTOMOLOGY

Winds Blow Insects at Rate Of 100 Miles Per Hour

Air-Borne Invasions Menace to Forests; Starvation Prescribed Against Cutworm; Ticks May Suffer Too

AERIAL invasions caused by winds blowing large numbers of dangerous insects hundreds of miles in a few hours constitute a menace to our forests and agriculture, Dr. E. P. Felt, entomologist of Stamford, Conn., told the American Association for the Advancement of Science in Ottawa.

Dutch elm disease, now a serious problem in the eastern United States, is being spread presumably by wind drift of the European elm bark beetle, the principal carrier of the disease, Dr. Felt indicated.

Using balloons to measure the travel of insects drifting at considerable heights in air currents, Dr. Felt came to the conclusion that this mode of travel is more important than hitherto believed.

Winds may carry insects in large numbers for 800 miles under exceptional circumstances. Insects drifting at rates of 50 to 100 miles per hour are not uncommon.

The appearance each year of the southern cotton moth in New England and southern Canada is attributed to wind drift, and Dr. Felt believes that the recent distribution of the European spruce sawfly in a large part of New England is due to the wind.

Insect Intelligence Service

Reporting insect plagues as fire-guards report forest fires, Canada's forest insect intelligence service, maintained by government and private agencies, performs a useful role in safeguarding the Dominion's timber resources, J. J. de Gryse of the Canadian Department of Agriculture told the meeting.

Last year the service made almost 3,700 reports accompanied by specimens, and gave valuable information concerning destructive insects and their distribution. Usefulness of such a service is emphasized by the fact that while forest fire reporting has long been actively carried out, insect reporting has not had the same amount of attention. Yet an infestation of a particular insect pest can frequently do as much if not more harm to a timber stand than that done by fire.

Scientific Starvation

Scientific starvation was prescribed as the best treatment for the cutworm, one of the most serious insect pests of the western plains of Canada and the United States.

Destruction of all vegetation in a field by plowing it under after it has reached a height of one and a half or two inches and delaying seeding for ten days kills off the young larvae of this pest. The larvae feed only on vegetation growing above the surface of the soil.

This was suggested by H. L. Seamans and P. J. G. Rock of the Dominion Entomological Laboratory at Lethbridge, Alberta, in Canada's grain belt. While the exact starvation formula might be different farther south in the United States, the same principle has been put to work there.

Ticks May Suffer

With increasing realization that ticks of various species are among the most important pests and carriers of diseases, it may be some consolation to know that some of the infections they carry may affect the ticks themselves adversely.

Dr. Cornelius B. Philip, of the U. S. Public Health Service laboratories at Hamilton, Mont., also told fellow scientists that aside from their indirect and direct effects as parasites, disease-producing agents in animals, naturally or experimentally tick-borne, include a remarkably wide variety of organisms grouped under spirochaetes, sporozoans, flagellates, rickettsias and bacteria, as well as certain ultrascopic or filterable viruses.

Drought-Resistant Plants

Specifications for root systems of drought-resistant plants were laid down for breeders by Prof. Paul J. Kramer of Duke University. The breeder who wishes to produce such plants, he said, "should attempt to produce plants with vigorous, rapidly growing, much branched root systems, the growth of which is not easily checked by decreasing soil moisture. Furthermore, injury caused by inability to absorb sufficient water from cold soils would be greatly decreased if root systems could be produced containing protoplasm the viscosity of which was little affected by temperature."

Insect-Resistant Plants

One way of fighting insects that is producting results is to develop strains or varieties of plants that resist attack by the insects, Drs. W. P. Flint and J. H. Bigger of the Illinois Natural History Survey reported. Research has progressed so far that corn and wheat more resistant to insect damage are available practically. Sometimes it is possible to breed plants that the insects do not like, while in other cases plants that resist the attacks can be produced.

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From Page 27

for older men and women, at the same time giving the youngsters the advantage of additional training.

The competition becomes less keen as we go up the scale in jobs, but even for college graduates the outlook is none too good in 1938.

The top-ranking third of the June seniors at most colleges had jobs waiting for them when they graduated, but the remainder of the class had to get out and hustle for their means of bread and butter, it was revealed by a May survey by the Northwestern National Life Insurance Company of 78 universities and technical schools.

Jobs for this year's college graduates are from 10 to 60 per cent, fewer than last year, although starting salaries are almost as good, they found.

Most schools hope that from two-thirds to three-fourths of their graduates may have found work by fall, and they feel that any improvement in business conditions would quickly absorb many entire classes.

The majority of present employment calls are for salesmen in the general business and insurance fields, and for accountants, it was found. The oil and petroleum industries were the biggest bidders for engineering school graduates. Several schools reported that governmental agencies, state and federal, offer the most active employment demand for their graduates now, with highway, relief and social service work mentioned most frequently.

A good many plan to go on with graduate study because employment is scarce, but on the other hand, increasing numbers of old alumni are coming back and asking for aid in getting new jobs, having lost those held, in many instances, for many years.

What is the permanent answer to this youth-employment problem? Many experts are putting their heads together in the effort to find it. Particularly in the NYA, government officials are battling the problem.

Some possible remedies for those in the farming regions where the situation is most difficult have been proposed by Dr. Carl C. Taylor, of the U. S. Department of Agriculture.

To reduce the birth rate would perhaps be advantageous but would have no immediate effect on the problem, so, skipping that alternative, he goes on to more practical measures.

First is the development of a live-at-home type of farming which would provide for production for home use.

"The promotion of such a system of farming is not, as some argue, an attempt to turn back the pages of progress," Dr. Taylor said. "It is an attempt to write the greatest degree of security under the lives of millions of farm families who have their destinies in their own hands to a greater extent than any other segment of our national population . . .

"The direct result of not doing this in the South, where the standard of living is low, and population maladjustment is more obvious, is the absence of milk, eggs, and fruit in the diet of cotton producers. The remedy is the production in the South of these products for home consumption."

Farming of this type does not provide much money income, but it does permit an independence and security not attainable by the person who works for a wage.

Another remedy is a combination of farming with another type of occupation —a handicraft or part-time or seasonal employment. A recent tendency toward decentralization of industry has taken factories to the farming regions.

During the depression, the number of available industrial jobs in the east south central states actually increased by about 7,000, despite the decrease over other parts of the country. If minimum wage legislation increases labor costs in this region this tendency may not continue, however.

Finally, by cooperation of various agencies of the Government and interested private organizations, young people of the nation can be aided to obtain vocational guidance, training for skilled employment and handicrafts, be guided to suitable regions for best opportunities, and through such a set-up as the CCC, be given the chance to develop physically and socially until such time as they can secure useful, self-supporting employment.

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Science News Letter, July 9, 1938

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GEOLOGY

Yellowstone Geysers Put on Good Show This Season

GEYSERS in Yellowstone National Park, spectacular enough at all times, appear to be putting on a special show this season. Old Faithful has been spouting to unprecedented heights. Recently an eruption reached the height of 223 feet, which is 73 feet above its 150-foot average and 32 feet higher than its previous record of 192 feet.

Grand Geyser has taken a new lease on life, with 200-foot eruptions at thirty-hour intervals. The Giantess, largest of all geysers, has erupted four times in nine months, which is about double its usual rate.

National Park Service observers are not yet certain whether there has been a general increase in geyser activity or simply a shift in underground water flow, increasing the activity of some at the expense of others.

Science News Letter, July 9, 1938

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ENGINEERING

Test Giant Circuit Breakers On "Live" Power System

Electrical Engineers Hear That Graduates in This Profession May Expect Good Salaries, Quick Promotion

See Front Cover

ELECTRICAL engineers have "pulled" a short circuit to end all short circuits, it was reported to the American Institute of Electrical Engineers, meeting in Washington, D. C.

In a test on oil-filled circuit breakers, described by Philip Sporn and H. P. St. Clair of the American Gas and Electric Service Corporation, New York City, the flashing arc drew 2,000,000 kilovolt amperes.

This arc, assuming that it could continue without burning up all the electrical wires of the land, would be sufficient to supply the peak power demands of about 3,000,000 people; comparable perhaps to Chicago.

This tremendous arc, however, was quenched harmlessly in the oil circuit breakers and the current restored within four cycles of the alternating current; within six hundredths of a second.

Technically the reactance of the circuit is the 2,000,000 kilovolt ampere figure cited by the engineers. This reactance is 90 degrees out of phase with useful current of the circuit. However, the current which did pass in the arc—if it had been in the proper phase—would have been sufficient to supply, for an instant, a city the size of Chicago.

The cover of SCIENCE NEWS LETTER this week shows how giant oil circuit breakers are tested in electrical shops before being placed in service. By adjusting the space between the large spheres, engineers are able to regulate as many as 750,000 volts from a transformer before they are applied to test the circuit breaker.

A Good Profession

This year's crop of high school graduates looking forward to college, and the course they will take there, might look twice at salaries of the engineering profession reported by Prof. R. W. Sorensen, California Institute of Technology.

Graduates of a four-year engineering course start low—at perhaps $25 or $30 a week—but most of them quickly are promoted to more lucrative jobs.

Some of them, in the highest 10 per cent. will eventually reach an average salary peak of between $12,000 and $13,000 a year. For a quarter of them this peak will be about $7,500 yearly and half of them will reach the $5,000 a year class.

Moreover, the earning period (with ever-increasing salary) is very long for engineers. The peak salary is not reached until about the 60th year, or 37 years after graduation. Lawyers and doctors, Prof. Sorensen said, seem to follow a comparable earning curve. During the depression less than 3 per cent. of the various engineers in the country were unemployed.

Finally, engineering is a profession in which many students work their way through college, Prof. Sorensen pointed out. He cited one college where about a sixth of the students came from families having incomes of only $1,200 a year or less and who were receiving help from the National Youth Administration.

Graduates of engineering colleges do not fail to reach expected goals because of lack of technical training, said Prof. Sorensen, but because some of them lack other qualities which include: personality, loyalty, patience, breadth of interest, business ability, leadership, aptitude, promptness, accuracy, judgment, executive ability and a proper estimate of their own value.

Science News Letter, July 9, 1938

• Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenters:

Thursday, June 23, 7:54.4 a. m., E. S. T. **Region of the New Hebrides Islands, 1100 miles northeast of Brisbane, Australia. Latitude 20 degrees south, longitude 169 degrees east.**

Saturday, June 25, 6:45.1 p. m., E. S. T. **Arctic Ocean north of Scandinavian peninsula. Latitude 77 degress north, longitude 14 degrees east.**

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL May 21.

• Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.

GEOLOGY

Geologists Are To Study "First Texans"

STIRRED by discoveries of remains of early man and of animal bones near Alpine in the rugged Big Bend country of southwestern Texas, geologists this summer will study the Pleistocene, or Ice Age, deposits of that region, it is announced by the Geological Society of America.

In 19 locations already found, tools left by these "first Texans" have been found from seven to 20 feet below the surface. The investigators, Drs. Kirk Bryan, professor of geology in Harvard University, and Dr. Claude C. Albritton, instructor in geology at Southern Methodist University, have just been awarded a grant from the Penrose bequest of the society to carry on the research.

Science News Letter, June 25, 1938

SOILLESS
Growth of Plants

by Carleton Ellis and Miller W. Swaney

THE first complete treatise in book form on this immensely important subject which discusses thoroughly all three methods of Soilless Growth—Water Culture, Sand Culture and Sub-irrigation.

Interesting, timely, and instructive both to scientists and laymen is this new comprehensive book on the art of growing plants without soil. Probably no technical development of the past decade has made a more triumphant entrance into the realm of lay science than has the soilless growth of plants. So important is this new development in plant growth, that the National Resources Committee selected it as one of the few recent technical advancements likely to help fashion the future of this country. So fascinating is this method of growing flowers, vegetables and fruits, that the desire to try out this "new way" is spreading with phenomenal speed.

Table of Contents: Chemistry of Plant Life; Growing in Mineral Aggregates; Sand-Culture Method; Sub-irrigation Method; Growing in Water; Walter-culture System; Nutrient Solutions; Household Plant Culture; Growing Flowers for the Family; Growing Vegetables for the Family; Commercial Aspects; Special Chemicals; Plant Hormones; Doubling Chromosomes in Plants; Effects of Miscellaneous Chemicals on Plants; Common Detriments; Nutrient Formulas; Index.

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•First Glances at New Books

Horticulture

SOILLESS GROWTH OF PLANTS—Carleton Ellis and Miller W. Swaney—*Reinhold,* 155 p., illus., $2.75. This appears to be the first really comprehensive popular treatise on the art of growing plants without soil, which has been causing a good deal of excitement lately. The authors describe fully, and illustrate in detail, a large variety of set-ups for both sand culture and solution culture, ranging in size all the way from individual pots for ornamental or experimental individual plants up to large-scale tanks suitable for commercial green-houses.

Science News Letter, July 9, 1938

History

MEN AND IRON: THE HISTORY OF THE NEW YORK CENTRAL—Edward Hungerford—*Crowell,* 424 p., illus., $3.75. A thoroughly readable volume telling of how old Commodore Vanderbilt, first a steamboat man and then a railroad magnate, built the "Central" and made through traffic possible; and of his son, William H. Vanderbilt, another famous railroad man known most for his "The public be damned." This is the story of the men who made a mighty railroad and of the many ingenious maneuvers they devised and stirring years they lived through in order to do it.

Science News Letter, July 9, 1938

Zoology

TURTLES OF THE CHICAGO AREA—Karl P. Schmidt—*Field Museum,* 24 p., illus., 25 c. This well-illustrated pamphlet will be useful over a very considerable part of the Mississippi valley.

Science News Letter, July 9, 1938

Engineering

AIR CONDITIONING, HEATING AND VENTILATING—J. Ralph Dalzell and Charles L. Hubbard—*American Technical Soc.,* 571 p., illus., $4. A practical treatise on the principles and application of any type of heating system to almost any type of building. A large section on air conditioning brings in the newer aspects of human comfort in the home.

Science News Letter, July 9, 1938

Engineering

ONE HUNDRED YEARS OF TRANSATLANTIC STEAM NAVIGATION 1838-1938—H. P. Spratt—*British Library of Information,* 23 p., illus., 20 c. This is a publication of the British government for the Science Museum in Kensington and accompanies an exhibit in the museum. Told in the form of descriptions of outstanding ships. The descriptions of some of the more recent vessels assume some familiarity with the technical language of marine engineering.

Science News Letter, July 9, 1938

Mathematics

TODAY'S GEOMETRY—David Reichgott and Lee R. Spiller—*Prentice-Hall,* 379 p., $1.84. Here is a high school text in geometry which ever seeks—by example—to liven the subject. Illustrations of geometry in the home, the factory, or any of the other aspects of modern living are used to teach the principles that have come down to us from Euclid.

Science News Letter, July 9, 1938

Chemistry

PHYSICAL CHEMISTRY—J. N. Bronsted—*Chem. Pub. Co. of N. Y.,* 394 p., $5. An excellent English translation of the very well known Danish text book. The approach to physical chemistry is through the foundation of thermodynamics. The book is probably of postgraduate school caliber in this country.

Science News Letter, July 9, 1938

Engineering

ELECTRIC WELDING—Morgan H. Potter—*American Technical Soc.,* 126 p., illus., $1.25. A practical textbook covering the fundamental principles and applications of the various types of arc welding equipment.

Science News Letter, July 9, 1938

Biography—General Science

ARCHITECTS OF IDEAS—Ernest R. Trattner—*Carrick & Evans,* 426 p., illus., $3.75. Stimulating, competent and readable accounts of the great theories of science, told around the personalities of Copernicus, Hutton, Dalton, Lavoisier, Rumford, Huygens, Malthus, Schwann, Darwin, Marx, Pasteur, Freud, Chamberlin, Boas and Einstein.

Science News Letter, July 9, 1938

Photography

PHOTOENGRAVING IN BLACK AND WHITE OR PHOTOENGRAVING PRIMER—Stephen H. Horgan—*Amer. Photo. Pub. Co.,* 112 p., $2. An elementary technical work intended particularly for apprentice engravers.

Science News Letter, July 9, 1938

Anthropology

CULTURE ELEMENT DISTRIBUTIONS: VIII, THE RELIABILITY OF CULTURE ELEMENT DATA—Harold E. Driver—*Univ. of Calif. Press,* 19 p., 25 c.

Science News Letter, July 9, 1938

Sport

AMERICAN RED CROSS SWIMMING AND DIVING—American Red Cross—*Blakiston's,* 271 p., illus., 60 c. A practical manual for those who want to learn to swim or dive or who wish to perfect their form in these sports.

Science News Letter, July 9, 1938

Engineering

FROM PLAN TO REALITY, TWO—*Regional Plan Association,* various paging, maps, $2, $1.20 to members. A second report on the progress of regional planning, in the New York metropolitan area. This covers the period from 1933-36, with a summary of the first four years, 1929-32. The latter period is covered in detail in an earlier publication.

Science News Letter, July 9, 1938

Engineering—Juvenile

ADVENTURES IN STEEL—Lavinia R. Davis—*Modern Age,* 166 p., 75 c. The story of steel and its fabrication told through the device of following the activities of a number of young steel workers.

Science News Letter, July 9, 1938

Physics

MOLECULAR BEAMS—R. G. J. Fraser—*Chem. Pub. Co. of N. Y.,* 70 p., $1.25. Here in 15,000 words is a roundup of discovery in this important field. Physicists will need no reminder that molecular beams provide one of the best research tools to investigate the secrets of magnetic properties and also the angular momentum in atoms and molecules.

Science News Letter, July 9, 1938

Zoology

NOTES ON THE ANATOMY OF THE TREESHREW *Dendrogale*—D. Dwight Davis—*Field Museum,* 21 p., 25 c.

Science News Letter, July 9, 1938

Botany—Misseny

EVERYMAN'S WILD FLOWERS AND TREES—Miles Hadfield—*Dutton,* 184 p., illus., $2. Descriptions and illustrations of 500 British plant species.

Science News Letter, July 9, 1938

Anthropology

TUBATULABEL ETHNOGRAPHY—Erminie W. Voegelin—*Univ. of Calif. Press,* 94 p., illus., $1.

Science News Letter, July 9, 1938

Anthropology

BEAR RIVER ETHNOGRAPHY — Gladys Ayer Nomland—*Univ. of Calif. Press,* 38 p., illus., 50 c.

Science News Letter, July 9, 1938